

8  
**CLAIMS**

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is as follows:

1. A method of making microscopic polymeric fibrous interconnections, comprising the steps of:

forming on a substrate positively charged and negatively charged droplets of one or more solutions each containing one or more polymers solubilized in one or more solvents, said positively charged and negatively charged droplets being spaced close enough together to have an electrostatic force created between one or more components of said positively charged and negatively charged droplets; and

permitting fibers to form between said positively charged and said negatively charged droplets.

2. The method of claim 1 wherein said forming step is achieved using electrospray ionization of said one or more solutions.

3. The method of claim 1 wherein said substrate is an electronic chip or biochip.

4. The method of claim 1 wherein said permitting step allows more than one fiber to be formed from at least a plurality of said positively charged and negatively charged droplets.

5. The method of claim 1 further comprising the step of recovering fibers formed during said permitting step.

6. The method of claim 1 wherein said positively charged and negatively charged droplets include the same polymer.

7. The method of claim 1 wherein the positively charged and negatively charged droplets include the same solvent.
8. The method of claim 1 wherein said fibers range in length from 1 micron to 50 microns.
9. The method of claim 1 wherein the positively charged and negatively charged droplets have a volume ranging from picoliters to microliters.
10. The method of claim 1 wherein said forming step is performed by depositing droplets of said one or more solutions on said substrate, and applying electric field between at least two different regions of said substrate where droplets in said first of said two different regions become said positively charged droplets and where droplets in said second of said two different regions become negatively charged droplets.
11. The method of claim 10 wherein said substrate includes an interdigitated capacitor.
12. A mat of microscopic polymeric fibrous interconnections, formed by the process of:
  - forming on a substrate positively charged and negatively charged droplets of one or more solutions each containing one or more polymers solubilized in one or more solvents, said positively charged and negatively charged droplets being spaced close enough together to have an electrostatic force created between one or more components of said positively charged and negatively charged droplets; and
  - permitting fibers to form between said positively charged and said negatively charged droplets.